Low Power Technologies and Integrated Power Management

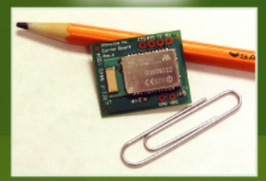
For Soldier Systems
- Total Power Solution from Power Source to Power Consumer
- Reduced Power Consumption
- Alternative Approaches to High Power Consuming Devices
- Low Power Designs

Reduce Battery Quantities

1.28W

Low Power Computer for Dismounted Soldier Applications

.16W

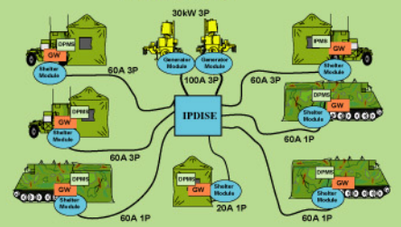


Ultra-Low Power General Purpose Bluetooth Module

0W

PARASCOPE: Zero Power Solution For Soldier Indirect Fire Around Corners

For TOC, Shelters, and Vehicles
- Focused on Intelligent Power Distribution
  - Excess Energy Storage
  - Load Shedding
  - Load Shifting



- Power is a Critical Technical Performance Measure that will impact a system's runtime, life cycle cost and weight.
- Power Management when integrated as part of the System Architecture will have the greatest impact on peak and average power

Reduce Fuel Consumption

Intelligent Power Distribution Illumination System Electric (IPDISE)
- Auto Phase Balancing
- Replaces 2 Boxes
- 'User Friendly' interface

In House Capabilities

The Army Power Division has been providing military power solutions for over 50 years. The Battery Branch supports soldiers and equipment developers with Battery R&D, Testing, Prototyping, System Integration and Power Management. The Branch has 20 engineers with Engineering Degrees in Chemical, Electrical, Computer and Material Science (2 PhDs, 8 MS) and approximately 18,000 sq ft. of laboratory space.

Electrochemical Measurements Lab
Battery T & E Lab
Charger T & E Lab
Technology Development Lab
Battery Test Facility (2535)

Battery Performance and Environmental Testing:
- Over 200 Programmable Test Channels, 0V to 36V, 10mA to 1000A
- 30 Environmental Chambers, -100°F (-73°C) to 350°F (177°C)
- Simulated Operational Duty Cycles
- MIL-PRF, UN, UL Safety and Environmental Testing

Crush	Drop	Humidity
Short Circuit	Shock	Immersion
High Temp.	Vibration	Flame
Forced Discharge	Impact	Desert Cycle

TEAM C4ISR

"Technology to the Warfighter Quicker"

Battery Branch

Army Power Division

RESEARCH • DEVELOPMENT • ENGINEERING COMMAND
CUM SCIENTIA COMMUTARE

CERDEC
US ARMY–RDECOM

COMMAND POWER NAVIGATION CONTROL

Mission Statement:
To provide advanced battery and portable power solutions for the soldier through design, development, analysis and engineering efforts to meet mission requirements

FORT MONMOUTH, NEW JERSEY

CERDEC
US ARMY – RDECOM

Army Power Division
Battery Branch

Life Cycle Managment
Design to Disposal

- System Power Source Development and Integration
- Cell and Battery Testing and Evaluations
- Charger Development and Evaluations
- Independent Government Testing (IGT)
- Low Power and Power Management Techniques
- Prototype Fabrication
- Battery Pack Designs
- Product Field Testing
- Vendor Selection Consulting
- Battery/Charger Procurement and Logistics
- Safety Testing and Safety Releases
- Failure Analysis
- Life Cycle Cost Estimates
- Disposal Guidance

PEO and PM Support:

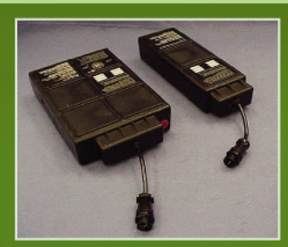
- Technology Transition to Prime Contractors or LSIs
- Leveraging of ATOs, SBIRs, DARPA, Plus-Ups, etc.
- Quality Matrix Engineering Support
- Participation on Program IPTs and Working Groups
- Information for Milestone/Decision Reviews
- Test and Evaluation (T&E)
- Risk Assessments and Mitigation
- Capability Document Analysis
- System Performance Specification Development
- Earned Value Management
- Source Selection Support
- Market Surveys

Increase Runtime, Reduce Weight, Reduce Cost

Batteries

Battery Solutions for all Military C4ISR Needs:

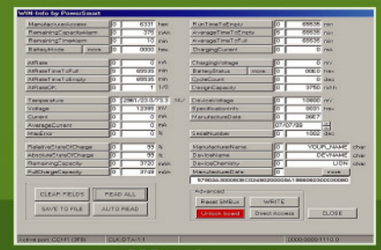
- C4ISR: Radios, GPS, Handheld PDAs, Night Sights, Laser Range Finders, Chem-Bio Detectors, Sensors, Aiming Lights, etc.
- Commercial Off the Shelf Solutions
  - AA, 2/3A, D cell configurations - Li/MnO2, Li/FeS2, Alkaline
- Improved Standard Army Batteries
  - Latest chemistries: Li-ion, Polymer, Li/MnO2, Li/CFx, Li-Air, Zn-Air, Ni-Zn
  - Applications: SINCGARS, TWS, MELIOS, JAVLIN, MBITR, CLUs, etc.
- New Form Factors
  - Solutions with Application Specific Dimensions and Power Requirements
  - Applications: Land Warrior, Future Force Warrior, Sensors, UAVs, UGVs etc.
  - Source Selection Support
  - Market Surveys



Smart Battery System

Smart Battery System (SBS) Compliant Products

- Allows for accurate state of charge communication from the battery to the end item
- Enables chemistry independent smart charging
- Facilitates system level power management
- Open architecture - SMBus -System Management Bus Protocol v1.0

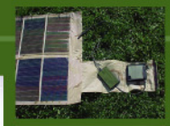


SBData Compliant

Smart Batteries

Level III Smart Charger

Pocket Charger



Level II Smart Charger

- Charges Battery from any 10V-32V DC source
- Multi-Purpose, Battery Chemistry Independent, Level 2 Smart Charger
- Small and Lightweight – 0.62lbs, 17 in^3
- Recharge Time ~ 4hrs

Chargers

SP4

55 Watts!

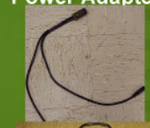
Soldier Portable Photovoltaic Power Pack - SP4

- Enables the warfighter to charge the BB-2590/U batteries during day light hours when vehicle and/or generator power is not available or during silent watch operations.
- Charges one BB-2590/U in less than six hours (conditions permitting) of sunlight
- 10X reduced reflectivity (glint/glare), Camouflage capability
- Weight: 5lbs (w/o batteries), Packed Volume: 10.5"x8.5"x1.4", Deployed Area: 32.5"x50"

Rucksack Portable Charger

- Charges a Battery from:
  - 24V DC (vehicle)
  - 12V DC (cig)
  - AC
  - Solar (SP4)
  - Future Fuel Cells
- Small, Lightweight Soft Case Kit – 3.9 lbs, 810in^3
- Recharge Time ~ 4hrs

AC and 12VDC Power Adapter



HUMVEE 24VDC Power Adapter

BB-2800 Adapter

Li Ion Charge Controller

BB-2590 Adapter

Battery Charging Solutions for any Military Vehicle Platform

- Integrated Bulk Battery Chargers
- NATO Slave Adapters
- DC to AC Inverters